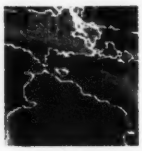


Editorial Index January 1986-December 1986

Systems Architecture

Touch Screens Turn To Sound. Is touch screen a mass technology? This feature looks at applications. JAN 86 p.20. ***P***

Drives Get Carded. A whole slew of 10-Mbyte and 20-Mbyte drives are now available on a single PC card. JAN 86 p.21. ***P***

Optical Disks Slip On Compatibility. Even though optical disks appear to be the answer to rapidly escalating mass storage requirements, some technical hurdles must be overcome before they gain large acceptance among systems integrators. JAN 86 p.28. ***P***

Multiprocessing Places Demands On The VME/Versabus. Normally bus arbitration and bus error control are separate considerations when designing a hardware system. But these issues become complicated in a system with multiple processors. JAN 86 p.39. ***CP***

MicroVAX II Zeros In On CAE. The MicroVAX II continues to gain market share. FEB 86 p.21. ***CP***

Diverse Systems Hop On Ada Bandwagon. Compilers are now being announced for the Ada language. FEB 86 p.27. ***S***

Boards Ease X.25 Protocol Implementation. X.25 is now supported on a range of different boards and bus structures. FEB 86 p.38. ***B***

Getting The Most Out of BITBUS. BITBUS, a distributed operating system based on a high-speed serial communications link, is becoming a standard for distributed control networks in the industrial automation revolution. FEB 86 p.69. ***B***

Add-on Turbocharge MicroVAX II Performance. New memory and controller boards on the Q-bus streamline the MicroVAX II's performance. MAR 86 p.27. ***B***

Board-level Units Choose MS-DOS For Simpler Development. Software development cycles free themselves from expensive development systems. MAR 86 p.29. ***B***

IBM Blitzes CAE/CAD Workstation Market. IBM enters a domain owned by Digital Equipment. MAR 86 p.31. ***CP***

Spectrum Of RISC Machines Debuts From HP. HP, like IBM, endorses the RISC architecture. MAR 86 p.33. ***CP***

Transaction Multiprocessing Goes On-line. A multiprocessor system has transaction processors optimized for specific functions. MAR 86 p.35. ***CP***

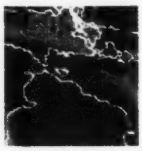
Non-von Neumann Architectures Part I: Parallel or Paralyzed? Breaking the von Neumann bottleneck, or finding a way around it, is the main impetus behind work on non-von Neumann and parallel architectures. However, while parallelism may be a vital component of non-von Neumann machines, not all parallel computers are non-von Neumann. MAR 86 p.38. ***CP***

BI Bus Boosts Performance Of VAX Systems. With the introduction of three new VAX computers, Digital Equipment Corp. has revealed details of its long-awaited VAXBI bus. MAR 86 p.46. ***B***

Apollo Battles To Hold Workstation Leadership. Apollo tries to regain ground lost to it from DECs MicroVAX II. APR 86 p.19. ***CP***

Choices Expand For UNIX On The PC/AT. Choices ranging from several native ports on the 286 to coprocessor implementations are now available. APR 86 p.25. ***S***

What is Artificial Intelligence? With researchers getting closer to the goal of intelligent computers, the promise of artificial intelligence technology becomes more obvious. However, whether or not AI can be thought of as an imitation of human intelligence depends on how you define intelligence. APR 86 p.55. ***S****



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Systems Architecture *Continued*

Interfacing To The RT I/O Channel. The design of the RT/PC required efficient support of the new microprocessor as well as compatibility with the existing I/O structures of the PC and PC/AT machines. APR 86 p.62. ***B***

Problems Delay Wedding Of Ada And 1750A Chip. Three Ada cross compilers for the DoD's triservice standard 16-bit processor should receive validation soon. MAY 86 p.21. ***S***

Terminal Controllers Cut UNIX Host Interruptions. Terminal controllers use faster processors and more memory. MAY 86 p.27. ***B***

Non-Von Neumann Architectures, Part II: Softness In Software. While the hardware may exist to break the von Neumann bottleneck, the software does not. A philosophical difference within industry may be hampering complete and efficient software development for the new breed of parallel machines. MAY 86 p.43. ***CP***

Artificial Intelligence Basics: Hardware Follows Software. Cheaper hardware now allows software developers to take advantage of symbolic programming techniques crucial to artificial intelligence applications. MAY 86 p.54. ***S****

Communications Processor Exploits Multibus II Bandwidth. The architecture of the Multibus II Parallel System Bus is tailored so only interprocessor messages use the system bus. On such a bus, a dedicated I/O processor with data buffering can battle data saturation. MAY 86 p.61. ***B***

CAD Tools Detect EM Emissions And Heat. Software and Hardware tools can now help the designer spot heat and EM emissions. JUN 86 p.19. ***S***

Cartridge Tape Scrambles To Match Disk Capabilities. Tape drive vendors face the challenge of matching the increased storage capacity of hard drives while maintaining 20-minute back-up time. JUL 86 p.23. ***P***

The Case For CASE. Software is now the major cost in designing any computer system. Although hardware engineers can take advantage of CAE/CAD tools for all phases of the design cycle, software engineers have had tools only for implementation and testing. Now, there are computer-aided software engineering tools that aid system analysis and specification. JUN 86 p.77. ***S***

Searching For CD-ROM File Formats. Interface and file format specifications are finally getting standardized. JUL 86 p.24. ***P***

Why Bother With Expert Systems? Although expert systems have, as yet, no common sense, they can help people familiar with a certain field perform at expert level. JUL 86 p.47. ***S****

MIPS Battle Heats Up In Workstation Segment. Sun unveils a 4-MIPS station. AUG 86 p.19. ***CP***

Small Drives Catch Up With Bigger Cousins. The trickle of 300-Mbyte disk drives with a 5¼" form factor threatens to turn into a torrent. AUG 86 p.27. ***P***

UNIX V Gets Locking, Streams. AT&T's UNIX System V, Release 3.0 includes the much-awaited support for Remote File Sharing (RFS). AUG 86 p.29. ***S***

Battle Of The Buses—Can We Talk? As the smoke clears in the competitive system bus wars, the real issues—making boards play with one another, handling of multiple CPUs, real-time capabilities—are coming into focus. AUG 86 p.34. ***B***

Expert Systems Leverage Designer's Knowledge. Intelligent tools for system design are the first signs that AI is out of the lab and into the real world. You will find the knowledge of the experienced designer incorporated into the sophisticated systems now making their debut. AUG 86 p.39. ***S****

Half-Height Rigid Disk Drives Fill The Void. The stakes get higher as disk drive capacities go up again. SEP 86 p.20. ***P***

Programming Gets Object Oriented. Object-oriented programming joins the list of AI technologies finding their way into commercial use. SEP 86 p.28. ***S***

DMA, Data Acquisition And The Personal Computer. Designers meet new problems when they encounter real world, analog interfacing. Techniques looked at address DMA transfer issues as well as problems associated with data acquisition and the PC bus. SEP 86 p.33. ***B***

System Design Considerations For Multiprocessing. Sometimes a controversial topic, multiprocessing is here carefully considered. SEPT 86 p.67. ***B***

VSB: A Sophisticated Subsystem Bus. Functionally partitioned local subsystem bus improves total throughput. SEPT 86 p.73. ***B***

Switching Transients In Microcomputer System Buses. More system bus address and data lines mean more lines change state simultaneously—introducing larger ac switching currents. SEPT 86 p.81. ***B***

VMEbus And High-Performance Disks. Where disks on VME systems are concerned, performance means capacity and speed. SEPT 86 p.119. ***B***

A Communications Processor For The VAXBI. An intelligent board supports for fast comm links. SEPT 86 p.100. ***B***

Array Processors Tap Performance Benefits Of BI Bus Architecture. Combining DEC's new bus with an array processor solves bigger application problems. SEPT 86 p.114. ***B***

Intelligent Caching Controller Streamlines Multibus II. Bus interface silicon eases implementation of a 32-bit bus. SEPT 86 p.108. ***B***

Choosing Between An 8088 And A Z80 For Real-time Control. Picking between two processor stalwarts is aided by taking simple steps. SEPT 86 p.88. ***B***

Using The G-64 Bus In Midrange Industrial Applications. A bus fufills the need for compact, industrial-grade boards. SEPT 86 p.91. ***B***

B	***Boards***
P	***Peripherals***
S	***Software***
with * for AI	
CP	***Computers***
CS	***Communications***

Systems Architecture *Continued*

A Processor Card For The IBM RT/PC. RT-related memory management is considered. SEPT 86 p.94. ***B***

Airborne Architecture Standard Holds On. Some unexpected activity is altering the face of the 1750A Instruction Set Architecture. OCT 86 p.24 ***S***

AI Wars: Garbage Collection Gets Serious. Looking at AAAI '86, one finds that symbolic machine manufacturers are preparing for a full-scale assault on commercial success. OCT 86 p.48 ***SB****

Assuring UNIX Standardization: The System V Verification Suite. Competing versions of UNIX threaten to mire that system in a sea of inconsistency. A test suite makes sure that systems can truly be called "UNIX". OCT 86 p.53 ***S***

Software Vendors Tout 80386 For AI Applications. The 386 is the most-announced design-in this fall. Proponents claim it is an apt engine for artificial intelligence. NOV 86 p.28 ***S****

Speech Recognition Goes Phoneme. As pattern-matching runs out of steam, some designers take a route based on phonemes rather than words. NOV 86 p.30 ***P***

Common Commands Stabilize SCSI Standard. The promise of SCSI is threatened by the spread of products that are not fully compatible. Enter the Command Command Set. NOV 86 p.47 ***PS***

Ada Finds A Real-time Home. Real-time tasking, modularity and structured programming features make the ADA language flexible. NOV 86 p.51 ***S***

Timing Is Everything: Delay Lines Cope With Faster ICs. Circuits can be very fast, but moving their signals across a board often proves to be the greatest problem. In response, delay lines must evolve along with other system elements. NOV 86 p.56 ***B***

Can Data Acquisition Live By Spreadsheet Alone? Is 1-2-3 adequate for real-time data analysis? That package's creator and other players have some opinions. DEC 86 p.26 ***S***

Board Density Soars As Prices Plummet. Card functionality is increasing and prices are dropping. Even old-line bus vendors see opportunities in PC Bus designs. DEC 86 p.28 ***B***

High-end Buses Face PC Challenge. As the 80386 arrives to invigorate Multibus I designs, the VMEbus gains ever more adherents. Both are being stalked by a formidable adversary—the PC Bus. DEC 86 p.30 ***B***

AI Meets Parallel Processing. Tools are emerging for distributed processing of large-scale artificial intelligence problems. A hybrid symbolic/numeric processor may soon overcome the obstacles posed by such large-scale problems. DEC 86 p.38 ***CS****

B	***Boards***
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Advanced ICs

Bit-slice Machines Move Up To 32 Bits. More manufacturers have entered the bit-slice arena. JAN 86 p.24.

Chip-sets Simplify Memory Control Design. New DRAM controllers put more functionality on chip. JAN 86 p.27.

Number Crunching Graphics Processor Pushes Pixels. Until recently, designers faced with building bit-mapped graphics systems could choose either a current general-purpose processor or a specialized graphics controller. Texas Instruments' new Graphics System Processor offers another alternative. JAN 86 p.61.

Language-specific ICs: Optimal Execution Solution. Today, many companies are actively engaged in producing not only processors but complete computer systems specifically tailored toward the execution of languages such as Forth, Lisp, Prolog and C. JAN 86 p.71. *

Multichip RAMs Lead Way To Wafer-scale Integration. Prototypes of 256-Kbit static RAM modules are now available. FEB 86 p.29.

Synchronous SCSI Controllers Offer Upgrade Path. Data transfer rates as high as 4 Mbytes/sec make synchronous SCSI competitive with ESDI and SMD. FEB 86 p.31.

Digital Signal Processing Moves On Chip. A whole slew of new single chips to challenge TI's position. FEB 86 p.33.

ISSCC: Solid State Of The Art. The recent International Solid State Circuits Conference gave a good indication of upcoming technology trends. This year, the systems houses demonstrated the integration of mainframe power onto single VLSI ICs. FEB 86 p.76.

Digital Signal Processor Moves Memory Off Chip. Single-chip DSP microcomputers have often been relegated to the low end of the performance spectrum, mainly due to small on-chip program and data memory. Recent advances seek to overcome these limitations. FEB 86 p.83.

256K EEPROM Opens New Doors For Designers. Refinements to the EEPROM page mode feature have eliminated the performance limitations of early page mode parts. The combination of fast byte write and page mode in a single part gives designers the best of both worlds. MAR 86 p.57.

Single-chip DSP Segment Heats Up. Yet more single-chip devices to challenge TI's markets here. APR 86 p.20.

On-chip Refresh Makes DRAMs Look Static. Designers can choose different modes of refresh in newer DRAMs. APR 86 p.21.

Video DRAMs Shift Image Of Graphics Systems. With screen refresh alone taking up a large portion of a normal memory's bandwidth, data accessibility presents a problem for designers of refresh or bit-mapped graphics systems. Video DRAMs have helped to break that bottleneck. APR 86 p.28.

Advanced ICs *Continued*

Message Passing Coprocessor Simplifies Multiprocessor Systems. The evolution of multiprocessor designs has stressed traditional configurations and intermodule communication methodologies. Using a coprocessor to reduce interprocessor communication overhead and to provide system-wide configuration capabilities may address some of the multiprocessor system's problems. APR 86 p.34.

Processors Take A RISC. Two RISC machines aimed at two different markets have been announced. MAY 86 p.23.

Fast Fourier Transform Speeds Signal-To-Noise Analysis For A/D Converter. Determining the SNR of an A/D converter with an FFT may be better than analog techniques. However, special care must be taken in setting up the test and interpreting results, because errors are introduced by both the A/D sampling process and the finite interval used to gather the FFT data. MAY 86 p.64.

Hierarchical Memory Features Multilevel Access Paths. A unique memory organization allows a random-access memory to achieve three levels of access. The fastest mode can enable read data rates approaching 100 MHz. MAY 86 p.67.

Interface CMOS: The Missing System Link. CMOS has become the choice for logic replacement in digital systems. JUN 86 p.21.

Gallium Arsenide—A Semicustom Approach. Though still in its infancy, GaAs is gaining momentum. Commercial GaAs vendors are reducing the entry cost and providing the necessary CAE/CAD tools. JUN 86 p.89.

Floating-point Devices Integrate It All. Levels of integration continue to increase allowing a single chip to incorporate a floating-point multiplier, ALU and a register file. JUL 86 p.21.

Application-specific Architectures Target DSP. Application-specific DSP chips that have algorithms hardwired directly into macrocell arrays offer a new alternative to the designer. JUL 86 p.69.

Array Processor Shrinks To Chip Set. A 1.5-μm CMOS process allows an array processor to be implemented in three VLSI chips. With the right software support, real-time digital signal processing may move within the reach of PC users. JUL 86 p.74

Liberty Chips Harbor Aboard 32-bit Boards. Very powerful single-chip devices are beginning to surface on board-level products. AUG 86 p.25.

Bit-slice Processors Blend Flexibility and Performance. Evolving bit-slice processors offer the designer a new array of implementation choices. Trade-offs versus other logic solutions must be considered more carefully than ever before. AUG 86 p.54.

EPROM Competition Heats Up. Off-shore vendors are pressuring Intel on the Megabit EPROM front. SEP 86 p.19.

MC68030 Manages Memory. New on the scene, the MC68030 processor combines the instruction set and performance of the MC68020 with the paged memory management of the MC68851. SEP 86 p.129.

Quantifying Modem ICs For Performance. Choosing the right modem IC can be simplified by adhering to the right guidelines. SEP 86 p.132.

Programmable Logic Vendors Clash Over Functionality. Programmable logic devices rival gate arrays as a major player joins the fray. OCT 86 p.28

Bus Interface Chip Streamlines System Design. An interface on a chip simplifies the building of systems based on the VAXBI bus. OCT 86 p.64

A Closer Look At MC68030 Memory Management. A new microprocessor generation offers on-chip memory management that leads to enhanced performance and reduced system cost. OCT 86 p.72

Taking Aim At Bit-Slice. High-level languages can now be compiled directly into 5-MFLOPS machines. NOV 86 p.21

Transputer Spawns A New Class Of Applications. Several innovative designers use the transputer chip to achieve truly parallel processing. NOV 86 p.34

GaAs Bit-slice Processors Blaze Past Silicon Equivalents. Though expensive, bit-slice devices done in gallium arsenide offer amazing clock speeds. DEC 86 p.22

Modular Architectures Break I/O Bottleneck. To capitalize on computer and disk drive advances, designers need a high-throughput controller that is both flexible and intelligent. DEC 86 p.56

Imaging and Graphics

Color Scanners Make Inroads At Low End. Low cost image processing workstations are now feasible with new scanners. JAN 86 p.19. ***G***

Array Processors: The Best Way To Process Images? Single instruction/multiple data (SIMD) and multiple instruction/multiple data (MIMD) architectures will combine in future array processors to offer both speed and flexibility. JAN 86 p.47. ***G/I***

OEM Imaging Springs From Unlikely Sources. A number of companies have introduced imaging products in the past month. This is a review of them. FEB 86 p.25. ***I***

Video Conversion With ADCs and DACs. Rapid conversion of video signals is paramount in many image processing applications. However, the art of designing with high-speed ADCs and DACs is far from simple. FEB 86 p.57. ***I***

Imaging Rises To Meet User Demands. Board vendors target IBM and DEC hosts. MAR 86 p.23. ***I***

PC Transformed Into Image Processor. Digital image processing applications have been limited due to prohibitive systems costs and complexity of processing algorithms. But new developments have helped meet the needs of system integrators developing PC/AT-based systems. MAR 86 p.63. ***I***

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Imaging and Graphics *Continued*

Digital Image Processing: An Introduction. Image processing covers the five areas of enhancement, restoration, compression, segmentation and image description. The scope of these areas ranges from preprocessing to the extraction and description of objects or regions within an image. MAR 86 Special p.15. ***I***

Image Generation For Microcomputers. Image processing functions such as image capture, contrast enhancement, noise reduction filters, histograms and convolutions can be performed on the PC using a software package. MAR 86 Special p.23. ***I***

Coprocessors Provide Integrated Video And Graphics. By integrating graphics and video capabilities, manufacturers can offer board-level systems for applications such as simulation, animation and video production. MAR 86 Special p.25. ***I/G***

Small Format Color Plotting. Single multifunction electrostatic plotters save interfacing and remote line costs and eliminate the need for multiple supplies and data formats. MAR 86 Special p. 27. ***G***

Image Restoration Techniques. Digital restoration techniques caused by blurring, defocussing and atmospheric disturbances can be eliminated using mathematical techniques. MAR 86 Special p.29. ***I***

Dithering Extends Color Range Of Thermal Transfer Devices. Thermal transfer devices use dithering techniques to increase their color range. MAR 86 Special p.38. ***G***

VME Modules For Efficient Parallel Processing. Digital signal processing applications are often burdened with the task of processing large amounts of data in short amounts of time. To meet speed requirements, parallel architectures can be used. MAR 86 Special p.43. ***I***

Graphics Display Controllers In Image Processing. One of the most important features in image processing is the ability to control LUTs. Graphics boards with this capability can be used to perform limited image processing. MAR 86 Special p.45. ***G***

Integrating Linear And Area Arrays With Vision Systems. Although linear and area array outputs are similar, the application of these imagers is different because of the scanning methods used. MAR 86 Special p.47. ***I***

Interfacing High-Resolution Solid-State Cameras To Digital Imaging Systems. Recent advances in solid-state camera technology have led to a re-examination of the camera/computer interface. Key to this is the need for a tighter integration between the camera and host system. MAR 85 Special p.51. ***I***

S-100 Boards Combine Graphics And Video Functions. Now that modular imaging and graphics boards are becoming available, systems integrators can develop image processing systems, graphics systems or a combination of the two. MAR 86 Special p.54. ***G***

Image Processing With The IBM PC. IBM's PC can be expanded in a variety of ways with expansion boards to fulfill a number of different image processing requirements. MAR 86 Special p.57. ***I***

Adaptive Filtering Of Digital Video Signals For Image Enhancement. Developing image processing algorithms for VLSI components can be accomplished using array processors and imaging software. MAR 86 Special p.61. ***I***

Advances In High-Resolution Display Technology. Recent advances in digital and raster technology have made it possible for very high-resolution displays. Development of an 8-beam CRT display is described. MAR 86 Special p.66. ***G***

Pipelined Image Processor IC Speeds Imaging Tasks. A data flow architecture has been implemented in a single chip to perform image processing functions. MAR 86 Special p.73. ***I***

PCs In Imaging Systems Design. PCs are giving the minicomputer competition in medical, scientific, graphic arts and office automation applications. MAR 86 Special p.77. ***I***

Development System Targets Image Processing Software. Image processing software which provides a tool-kit for developing image processing algorithms is described. MAR 86 Special p.79. ***I***

Merging Computer Graphics With Image Processing. Many image processing vendors are now including some graphics capability in their products. MAR 86 Special p.86. ***G***

Image Processor Integrates Spatial And Transform Processing. Image processors based on the conventional von Neumann computer architectures cannot take advantage of the parallelism inherent in many image processing applications. MAR 86 Special p.89. ***I***

Array Processor Speeds Workstation Imaging Functions. Array processors can be used to reduce the processing time of many image processing applications. MAR 86 Special p.91. ***I***

It's In The Cards For Graphics Systems. System companies bring out board-level graphics solutions. APR 86 p.27. ***G***

Image Compression Cuts Imaging Problems Down To Size. Image compression arose as a solution to the challenge of speedy image transmission in early military and commercial point-to-point subsystems. Advances in compression technology are now leading to cost-effective integration of digital imaging into general-purpose computer systems. APR 86 p.40. ***I***

Standalone Imagers Focus On Workstation Segment. Many manufacturers are looking towards introducing imaging workstations in the near future. MAY 86 p.17. ***I***

I ..... *Imaging with * for AI*
G ..... *Graphics*

Imaging and Graphics *Continued*

VME Imaging Boards Target Machine Vision. Although the VMEbus has proved apt for machine vision, it is not without problems. Small board size can make it hard to incorporate complex functions without taking up valuable system space. MAY 86 p.28. ***I***

Pyramid Processing Redefines Machine Vision. Pyramid processing techniques can be used to reduce image memory needs and ease computational requirements in machine vision. MAY 86 p.34. ***I***

Military Imaging Systems Find New Targets. Specialized image processors, orginally built for the military, are finding commercial applications. JUN 86 p.25. ***I***

Graphics Boards Tackle Imaging. A new breed of graphics controllers now performs functions associated with primitive image manipulation and processing, in addition to graphics generation tasks. Today's controllers present designers with interesting choices for implementing imaging applications. JUN 86 p.84. ***G***

Image Sensors Reach Megapixel Mark. VLSI technology is the driving force behind many recent ICs for image processing. JUL 86 p.25. ***I***

IBM Graphics Add-Ons—Emulating A Chameleon. New chips help the designer to follow IBM graphics standards. JUL 86 p.27. ***G***

PC Imaging Software Packs Floating-point Punch. An operating environment for image processing provides over 100 commands implemented in floating-point math that can be tailored or combined to develop new operations. JUL 86 p.50. ***I***

Euroboards Propel GKS Into Real World. Rather than configuring raster-graphic display electronics as peripheral devices, tightly coupling the host computer with the graphics subsystem can eliminate performance and packaging inefficiencies. JUL 86 p.58. ***G***

Interface Standard Promotes Device-independent Graphics. GKS has not solved the device interfacing problem faced by vendors of device-independent graphics packages. The Computer Graphics Interface (CGI) represents a possible solution. JUL 86 p.62. ***G***

VAX-To-AT Link Speeds Image Processing. As AT and VAX systems become prevalent in scientific settings, an imaging interface is required. AUG 86 p.23. ***I***

Large-kernel Convolutions In Image Processing. Recently developed approaches to large-kernel convolution will lead to easier pyramid processing of images. These less math-intensive approaches also mean faster image processing. AUG 86 p.46. ***I***

Solids Modeling: Hardware Grabs The Spotlight. Hardware advances are positioning geometric solids processing systems for impending breakthroughs. Controllers and displays are catching up with advances in CPUs and memory. Migration from software-intensive to hardware-intensive configurations will increase speed and improve interactivity. AUG 86 p.50. ***G***

Graphics Controllers Turn to GaAs For 2048 × 2048 Display. High-resolution workstations move to a higher plane as gallium arsenide devices drive a new monitor. SEP 86 p.23.

Pixel-Plane Machine Debuts At SIGGRAPH. A novel research approach shows the power of pixel-per-processor architectures. SEP 86 p.24.

AT&T Makes The Right Choice For Imaging Support. AT&T's strategy encourages third-party application packages for the imaging market. SEP 86 p.40.

Compression/Expansion Chip Eases Electronic Document Processing. A VLSI peripheral chip supports two types of compression and expansion. SEP 86 p.43.

PC Onslaught Leads To Lower-cost Graphics. Tek terminals face competition that now includes PCs emulating 4100 graphics. OCT 86 p.21 ***G***

Color Cell Compression Reduces Images To 2 Bits/pixel. A novel color image compression technique is based on an elegantly simple algorithm. OCT 86 p.23 ***I***

What's New In Imaging At EI '86. Set for Boston, this year's Electronic Imaging show will parade the products and technologies that drive the imaging industry's vigorous growth. OCT 86 p.57 ***I***

Image Hardcopy Moves Forward Bit By Bit. Getting an image on paper is not an easy task. But, the inevitable—photographic-quality resolution—gets more near as new color technologies come to the fore. OCT 86 p. 61 ***I***

Digital Filtering Of Electronic Images. Image enhancement, noise removal, image restoration and image coding are all techniques that may use filtering. OCT 86 *Special* p.12 ***I***

Large-area CCD Imagers. Designed for scientific imaging applications, large-area imagers with 2048 × 2048 resolution are now available. OCT 86 *Special* p.22 ***I***

Hardware For Dynamic Image Displays. Specialized architectures are required for applications that require multiple images to be displayed simultaneously. OCT 86 *Special* p.28 ***I***

Applying Image Processing To SEM Images. Scanning electron microscopes are now being tied to image processors for object size and shape classification. OCT 86 *Special* p.40 ***I***

VME Boards Tackle Asynchronous Data Acquisition Applications. Because of timing constraints, RS-170 synchronous digital video systems have inherent limitations. A VME-board set addresses this problem for data acquisition applications. OCT 86 *Special* p.45 ***I***

I ..... ***Imaging with * for AI***
G ..... ***Graphics***

Imaging and Graphics *Continued*

Applications Of Image Processing. In medical and seismic applications, image processing users require large image memories and high-speed processing. OCT 86 *Special* p.48 ***I***

Raising The Quality Of NTSC. Rather than adopt a new HDTV standard, several techniques can be used to improve the existing NTSC standard. OCT 86 *Special* p.52 ***I***

Algorithmic-based Machine Vision Computing. Several architectures have been used in machine-vision systems. Of these, many are optimized for the algorithms themselves. OCT 86 *Special* p.56 ***I***

GaAs Technology Drives 2k × 2k Display. Gallium arsenide technology has been used to design a controller to drive a 2048 × 2048 monitor. OCT 86 *Special* p.61 ***G***

601 Or What? 601 is the new CCIR standard for video. Because of its specifications, manufacturers are finding it difficult to comply with. OCT 86 *Special* p.63 ***I***

Pattern Recognition Theory And Practicality. Statistical analysis of image data is being used for image pattern recognition. OCT 86 *Special* p.69 ***I***

Clever Chips Ride Fast Buses. New-generation chips offer startling levels of performance, but power consumption and other pressing issues complicate their implementation. NOV 86 p.23 ***I***

Charge Ratio Simplifies Tablet Design. In some applications, established digitizing tablet technologies will soon contend with a charge-ratio method. NOV 86 p.30 ***G***

Image Filtering In The Temporal Domain. An advanced pixel processor configures to better filter real-world images that change over time. NOV 86 p.65 ***I***

Converters Put High-res Images On Tape. Vendors are filling the gap separating high-resolution display systems from established video standards. DEC 86 p.27 ***I***

Imaging Hardware Gets Software Support. At the EI show, imaging vendors vied for position. Clearly, software alliances have become crucial to success in that market. DEC 86 p.61 ***I***

Solid State Sensors Capture Bigger Images. While faster is better in the computer world, bigger is better in the sensor universe. But, the variety of sensor quality levels can pose certain problems for systems integrators. DEC 86 p.43 ***I***

Programming A PC-based Array Processor. Board-level array processors turn the PC into a minicomputer-like workstation. One system stresses microcode libraries for easier development. DEC 86 p.47 ***I***

I ..... ***Imaging***
with * for AI
G ..... ***Graphics***

VLSI Design Technology

Semicustom Alternatives Spawn Systems On Silicon. Enter a new breed of ASIC called the composable array. JAN 86 p.25. ***ICs***

Board Layout Systems Grapple With Advanced Technologies. Layout is becoming a crucial stage in the design cycle and designers must get involved. If designers and layout engineers interact only during occasional design reviews, the penalty is often flawed prototypes accompanied by major ECOs. JAN 86 p.55. ***W/S***

CAE Addresses RF/Microwave Design Challenges. CAE enters the analog domain. FEB 86 p.23. ***W/S***

Workstations Automate Analog Design. Although still in their infancy, analog workstations promise to provide analog designers with capabilities similar to those found on workstations used for digital design. FEB 86 p.40. ***W/S***

20K Gate Array Clears Path To Systems On Silicon. Single-chip systems are bringing about a new era in system design, but as device complexity and functionality increase, so do the various design problems. FEB 86 p.53. ***ICs***

ECL Gate Arrays Set Density Record With 5,000 Gates. NEC and AMD each have unveiled 5,000-gate devices but neither is stopping there. MAR 86 p.25. ***ICs***

PC Supports End To End Gate Array Design. Designing a gate array from start to finish on a PC provides designers with low-cost alternative high-end workstations or large host computers. MAR 86 p.75. ***W/S***

50K Gate Array Meets Tomorrow's Design Challenges. As design complexity increases, a need arises for sophisticated CAE/CAD tools that provide a clear and predictable design interface methodology. MAR 86 p.84. ***ICs***

Standard Cell Libraries Adapt EEPROM Macrocells. EEPROM macrocells find their way into standard cell libraries. APR 86 p.23. ***ICs***

Functional Simulation Fuels System Design. VLSI-based systems designs require a level of behavioral description and analysis which is far more sophisticated than those available as extensions or adjuncts to logic simulators. APR 86 p.45. ***W/S***

Advanced Logic Simulators Deliver Breakneck Speed in Multiuser Environments. As designers move into large-scale system design and simulation, the major criteria for evaluating the performance of simulation tools are changing. A network server transforms a simulation accelerator's theoretical capabilities into actual productivity gains in the design lab. APR 86 p.49. ***W/S***

W/S ..... ***Workstations/Software***
with * for AI
ICs ..... ***Custom/Semicustom ICs***

VLSI Design Technology *Continued*

Laser Customized Gate Arrays in 24 Hours. A fully customized chip can be delivered to the customer 24 hours after the customer signs off on the post-route simulation. MAY 86 p.24. ***ICs***

Tester Guarantees ASIC Performance. As ASIC complexity grows, designers must go beyond testing functional characteristics before beginning volume production. The dc parameters of prototype ICs may be just as important. MAY 86 p.73. ***W/S***

Performance Analysis Tightens Code. Systems designers can use information from software performance analysis (SPA) to monitor the efficiency, speed and compactness of a program. While SPA tools executing on logic analyzers have been available, the tools are just beginning to migrate to development systems. MAY 86 p.79. ***W/S***

Stimulus/Simulation Accelerator Verifies ASIC Design. A new tool speeds up the task of generating waveforms for simulation acceleration. JUN 86 p.23. ***W/S***

ASICS: Take Your Pick. With a variety of ASICs now available, designers have more choices for system implementation than ever before. The ASIC revolution requires that system engineers understand all of the trade-offs among devices. JUN 86 p.29. ***ICs.***

Integrating CAE, CAD and CASE. Design automation tools for nearly every phase of the design cycle speed the design process, but most of these tools work independently. Integrating the tools now becomes the challenge. JUN 86 p.40. ***W/S***

AI Emerges As Design Automation Force. While CAD/CAE tools mechanize routine design tasks, they do not necessarily make for better designs. Artificial intelligence, in the form of expert systems, allows designers to exploit the skills and knowledge of experts. JUN 86 p.48. ***W/S****

Advanced Algorithms Enhance Board Layout. A number of CAE/CAD workstations now support computer-assisted layout of printed-circuit (pc) boards. A core issue is the amount of control that rests with the designer during placement. JUN 86 p.56. ***W/S***

Bridging the Gap Between VLSI Design And Test. Validation and testing still represent bottlenecks in the design schedule. Computer-aided testing (CAT) tools speed development and grading of test patterns, in addition to breaking down the traditional barriers between design and test engineers. JUN 86 p.61. ***W/S***

Smart Tools Ease PLD Design. Advanced programmable logic devices (PLDs) are an increasingly attractive alternative to standard ICs and gate arrays. But device sophistication leads to design complexities. Design tools that automate much of the design process bring some welcome relief to the design task. JUN 86 p.72. ***W/S***

Programmable Transistor Array Boasts 100% Utilization. Analog semicustom ICs are now becoming a reality. JUL 86 p.17. ***ICs***

Programmable Logic Declares War On Gate Arrays. Armed with new architectures, low power dissipation, improved performance and reprogrammability, PLDs are mounting an assault on gate arrays. Choosing between a gate array and a PLD is no longer a simple matter of architectural flexibility versus turnaround time. The battle for the socket is on. JUL 86 p.32. ***ICs***

Crosspoint Switch: A PLD Approach. Erasable programmable logic devices (EPLDs) combine the gate densities of low-end gate arrays with the short development time and low cost of EPROMs. In a crosspoint switch design, availability of I/O pins, macrocells and p-terms dictates the number of switches that a single device can hold. JUL 86 p.40. ***ICs***

Optimizing And Verifying Software In Embedded Systems. Though a boon to programmer productivity, computer-aided software engineering may not mean faster code for embedded systems. But, back-end tools will deliver efficient, verifiable code. AUG 86 p.58. ***W/S***

Design Automation Conference Review. The view that emerged from June's Design Automation Conference in Las Vegas was that of a maturing industry ready to make good on its promises. SEP 86 p.47.

AI-based CAE Brings Spreadsheet IC Design. Choosing which device-type to employ is made easier via a system that uses artificial intelligence techniques. OCT 86 p.26 ***W/S****

CAE/CAD Platforms, Plateaus And Promises. Selecting a compute platform for CAE/CAD presents the designer with a complex set of technical considerations. Sorting out the options requires a look beyond raw speed ratings. OCT 86 p.34 ***W/S***

Automating Logic Design With Socrates. An advanced design system combines a logic minimizer and a circuit optimizer to automate the crucial steps in logic synthesis. OCT 86 p.44 ***W/S***

Behavioral Models Simplify System Simulation. Competition becomes more heated in the behavioral simulation arena. NOV 86 p.24 ***W/S***

Faster Logic Changes Rules For Board Design. Designers face a brave new world as they upgrade CMOS- and TTL-based boards. NOV 86 p.27 ***W/S***

CAE/CAD Databases: What To Leave In, What To Leave Out. Forming the foundation of any CAE/CAD system, databases can be optimized using "framework" architectures. NOV 86 p.59 ***W/S***

Mixed Analog/Digital Simulation: Here It Comes. Mixed-mode simulators are preparing to tackle semicustom and other design challenges. DEC 86 p.24 ***W/S***

Board Designers Benefit From Cell-based ICs. The flexibility and power of customizable designs present designers with a new set of issues. Design support from the cell-based IC vendor is crucial. DEC 86 p.52 ***ICs***

W/S ..... ***Workstations/Software with * for AI***
ICs ..... ***Custom/Semicustom ICs***